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THE
DIURNAL and ANNUAL
MOTIONS OF THE WORLD,

PHILOSOPHICALLY ACCOUNTED FOR,

With the Causes of the

VARIATION OF TIME, &c.

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NECESSARY FOR THE PERUSAL OF

*Astronomers, Students in Geography,
and Travellers.*

Written in plain Language.—Selected from the original
Manuscripts of a Work, entitled

THE INVESTIGATOR;

BY THE AUTHOR,

E. DUNN.

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The Author trusted two women with an original copy of philosophical sentiments

on the circulation of the blood; and on the cause of the formation of perfect, imperfect, and deformed shapes of male and female children in the womb, and their birth and growth to maturity; and of their progressive decay as they advance in age; intended for the instruction of inexperienced midwives, and to be annexed to the private practice of young students in anatomy, to save them some expence, and prevent part of the disagreeableness of their dissecting such numbers of human bodies, in order that fewer may suffice. But the aforesaid women, by refusing to return those manuscripts, defrauded the Author of them. Their names and places of abode he at present omits, but will inform any person who may require it; therefore, the Author hopes, that clergymen, philosophers, astronomers, physicians, surgeons, naturalists, antiquarians, artists, and mechanics will encourage him in the sale of this Publication; and, as he has avoided technical terms, and scholastic words, it may be of service to the generality of people.

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*to E. Dunn at the Prince
of Wales Hill Street
Birmingham
will be answered*

SENTIMENTS

ENDEAVOURING TO PROVE THAT THE RAYS
OF THE SUN ARE SPIRIT.

THE Sun appears so clear that it seems to be near the boundary of the atmosphere; but it is a large orb, situated at the distance of many millions of miles, and extends transparent rays of spirit through a part of space that is clear from æther and all matter. For if it contained any other substance, the immense thickness of it would gloom, or obscure that luminary from this world. As neither light, heat, or cold will exist of themselves without having a substance to enable them to reflect and impart either one or the other of their effects to matter, or the sight and feeling of creatures; and, as these beams penetrate and enliven trees, vegetables, animals, and insects, it proves, that they contain a substance of living spirit, and not that of dead matter.

As the rays of the sun extend swiftly between the stars, they diverge wider apart, and therefore chafe so little together, that the chief parts of the heat and light will progressively diminish

and become cool and dark, until they enter that part of the atmosphere which is next that luminary, and penetrate successively into, and cross, and chafe against each other in the centre of every particle of the circulating air, and thereby revive, or create, heat and light in them while passing through, and converging into a focus at a proportionate distance from each, according to the smallness of the size of each, and warm, enlighten, and distend other particles which are sufficiently near, so as to receive the converging points of those beams, in a similar manner to the operation of the rays of the sun when penetrating a burning-glass; they will cross each other, and chafe together while passing through the centre of it, and impart but little heat to the glass, although they will converge into a focus, and set fire to various kinds of substances, when either of them is situated at a proportionate distance to receive it.

That the heat diminishes from the rays of the sun as they extend to this world, may be known by cold that will sometimes freeze the drops of water in a cloud into hail, either nearly or perpendicularly over the equator, and frequently falling in storms to the water and earth: and also, by the frozen mist of clouds, or snow, lodging on the tops of extreme high mountains, such as Teneriffe and others, and remaining undissolved during the summer season, in that and other hot climates. That the light decreases from those beams, is proved by observing the darkness of them as they pass from

from that luminary to the moon and stars, until they enter those orbs, and penetrate the particles of matter, and revive; or create, heat and light in them, and they reflect and glance some of it to this world.

**ON THE CAUSE AND CONTINUANCE OF THE
DAILY REVOLUTION OF THIS WORLD.**

THE rays of the sun continually descend to that half of this terraqueous globe which is opposite that luminary during the day, and causes extreme heat at or near the equator, and temperate warmth in the southern and northern climates, and those beams being spirit, are of a different nature and substance to air, water, and earth; and they depress this globe, and prevent it from drawing so near to that luminary as for the heat of the rays to set fire to it, and dissolve the elements into lava; and on the contrary, during the night, the cold on the unenlightened part of the globe compresses it towards that luminary, and prevents it from receding so far from it, as for all the air, water, and earth on both sides of the world to congeal into ice; so that the heat on one half, and cold on the other, suspends and revolves this world daily in space under that luminary.

The rays of the sun, during the time of the forenoon, penetrate, warm, and open the pores of the generality of the particles of the water and earth

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(it is the pores in the interstices between the globules of air, water, and earth, which permit heat to divide the larger particles of those elements into numerous smaller, else those substances would be solid, and could not separate, and become so light in weight as to fleet with the wind) and exhale large quantities of mist from seas, rivers, and springs, and as they cool draw each other, and unite into numerous small and large clouds, and likewise extract and raise some of the small particles, light in weight, from land, minerals, ores, and fossils, and they attract and unite into many different vapours in the atmosphere; so that according to the various degrees of the heat of those beams they proportionally diminish a little of the bulk and weight of that part of the terraqueous globe until noon, while the contrary side of it from that luminary is darkened and heavier, and overbalances the enlightened side of it, that is less in weight, and assists to move it round its centre from the west towards the east in the first quarter of longitude until under the meridian of the sun at mid-day; then the heat of the rays, during the afternoon, fill the pores of the particles of water and earth, and depress and repel that part of the surface of this globe, and assist to move it round its centre from the west towards the east in the second quarter of longitude until in darkness; then during the first half of the night the chief of the warmth diminishes from the air, water, and earth; and cold will chill and contract the generality of the particles of water in the clouds

the clouds, and likewise those of vapours, and their smallness causes them to descend lower and the wind fleets the chief of them from thence, while some parts of each frequently falling either in dew, rain, hail, or snow, and adding a little to the bulk and weight of that part of the surface of this globe, overbalancing the enlightened side of it that is less in weight, and assist to move it round its centre from the west towards the east in the third quarter of longitude until midnight; and during the second half of the night, the cold in the atmosphere chills and compresses that part of the surface of this globe and assists to move it round its centre from the west towards the east, in the fourth quarter of longitude until it arrives in the rays of the sun, and measures the time of twenty-four hours of light and darkness each day in the northern and southern climates, except where it is light during half a year, and dark the other, at each pole of the globe, and in a similar manner causes the length of days and nights in all other parts of the world during every succeeding year.

**ON THE SWIFTNESS OF THE GLOBE REVOLVING
WITHIN THE ATMOSPHERE EVERY HOUR
DAILY.**

THE measure of the circumference of this
terracqueous globe is about 24,000 miles; and

as there are 24 hours in each day, consequently the surface of it at the equator, turns 1000 miles every hour within the atmosphere. But this globe is proportionally less in size in both the northern and southern latitudes, therefore it moves progressively slower at the surface in those parts; and seems to be almost in a still position near to, and at, each pole.

ON THE CAUSE OF THE REGULAR AND IRREGULAR LENGTH OF DAYS AND NIGHTS IN DIFFERENT PARTS OF THE WORLD.

As this globe moves round from the west towards the east, the surface of it moves in a straight line of direction under the sun, and it causes twelve hours day and twelve hours night at the equator during the year. But distant from thence in the northern and southern latitudes, the circumference of it is smaller from west to east, so that it seems to the inhabitants of those climates which are near each pole, to move in half a circle of space under that luminary each day; but it is the roundness of the world that permits the sun to appear above the horizon sooner in the morning and to continue later in the evening than at the equator, and causes the days to be longer and nights shorter during the summer, when it is either in the northern or southern latitude; so that when it is the season of spring and summer in the northern part of this world, the
days

days are longer and nights shorter in England, than at the equator; and the days longer and nights shorter in Scotland than at Russia: so that light increases, and darkness diminishes, in every northern latitude, until the sun appears above the horizon, and causes one day at the north pole to be equal to six months at the equator; and, during that time, the days successively shorten, and nights lengthen in the southern latitudes, until the bulk of this globe at the equator obscures the sun from the south pole, and causes one night to be equal to six months at the equator, and when it is spring and summer in this southern part of the world, the days lengthen and the nights shorten in a similar manner.

ON THE CAUSE AND CONTINUANCE OF THE
YEARLY REVOLUTION OF THIS WORLD.

THE heat of the rays of the sun during the day being insufficient to repel this world to an extremity farther distant than usual, and the cold in the atmosphere on the opposite side during the night, being insufficient to compress this teraqueous globe nearer than usual towards that luminary, yet those operations of heat and cold, move it in either a smaller or larger circuit under the sun, and those beams warm the northern climates, while the south pole is intensely cold; and afterwards warms the southern climes, while the north pole is extremely cold, and those contrary operations of heat and cold move this globe about in an oval circuit of space under the sun.

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When the southern part of this world is nearest the sun, the heat of the rays of that luminary causes the season of summer; and in various degrees of the different latitudes, warms the water in those climates, and exhales some of the particles light in weight, from those which are larger and heavier, in mists from seas, rivers, and springs, and as they cool mutually draw each other and unite into numerous thin and thick clouds, and also extract and rise some of the minute volatile particles from those which are coarser from earth, minerals, ores, and fossils, and as they cool, attract and gather into several sorts of vapours in that part of the atmosphere, and the wind fleets most of them from thence into colder climes, and diminishes a little of the bulk and weight of that half of this globe from the southern side of the equator, while the heat of those beams fills the pores of the particles of water and earth, and depresses, repels, and assists to move this globe circularly under the sun, and during that time the northern part of the world is farthest from that luminary, and causes the season of winter; and, the various degrees of cold in the different latitudes chills the air, and contracts the particles of water in the clouds, and also those of vapours smaller, and causes them to descend lower, and some parts of them frequently fall in either dew, rain, hail, or snow to the water and earth, and add a little to the bulk of that half of this globe from the northern side of the equator; and the increase of it in weight, forces and extreme cold in that part of the atmosphere, compresses and assists to move the world from
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the northern hemisphere in the first quarter of an oval circuit of space to the eastern hemisphere; and in a similar manner from thence in the second quarter of that circuit to the southern hemisphere, and during that time the northern part of the world is nearest to the sun, and the rays cause the various degrees of warmth in those latitudes from that side of the equator, and exhale mists from the water and vapours from the earth into that part of the atmosphere, while the heat of those beams depresses, repels, and assists to move this globe circularly under the sun; and during that time the southern part of the world is farthest from that luminary, and the cold in that part of the air causes some of the drops of water in the clouds, and also those of vapour in the air, to fall to this globe, and renders that half of it heavier, while the intense cold in the atmosphere compresses, and assists to move the world from the southern hemisphere, in the third quarter of an oval circuit of space to the western hemisphere; and in a similar manner, from thence in the fourth quarter of that circuit to the northern hemisphere.

Thus the heat of the rays diminishes a little of the bulk and weight of the water and earth in the southern part of the world; and also repels, while the increased weight of the northern part forces and cold in that part of the atmosphere, compresses this globe about, in half a yearly circuit; and during that time, the heat of the rays diminishes the northern part of this globe, and likewise repels, while the additional weight of the southern clime forces, and the

cold in the air compresses the globe about in the other half of a yearly circuit, and causes the time of one year; and as this world moves in an oval circuit successively, it will measure the time every succeeding year.

ON THE SWIFT MOTION OF THE WORLD, AND
THE MEASURE OF THE CIRCUIT OF SPACE
THAT IT MOVES IN.

WHEN the southern part of this terraqueous globe is nearest the sun, the rays, in a larger or smaller degree, warm and enlighten all those climates in the different latitudes from the southern side of the equator. Likewise, when the northern part of the world is nearest that luminary, those beams, much or little, warm and enlighten every clime from the northern side of the equator, without permitting either the north or south pole to advance so far as to arrive under the perpendicular sun, and proves that, according to the size and weight of this world, it proportionately moves 1000 miles every hour under the sun, in part of a circuit of space; that is, one year smaller, and another year larger in extent; but the medium between both measures is generally about 8,766,000 miles in circumference; otherwise, if this globe moved in an extreme smaller circuit than that, the rays of the sun could not warm the whole of it at different times, and cause the different seasons in the time of one year. And if it moved in an extreme larger circuit, it would frequently arrive
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so near to some of the surrounding planets as to obstruct them while revolving in their orbits.

ON THE SOUTH POLE OF THIS WORLD CONTINUING OPPOSITE THE SOUTHERN POLAR STAR, AND THE NORTH POLE OPPOSITE TO THAT OF THE NORTHERN POLAR STAR, WHILE REVOLVING YEARLY.

IN hot climates, the heat of the rays of the sun penetrates the earth, and warms minerals and ores, and exhales large quantities of small particles, light in weight, from the pores of those which are larger and coarser in their substances, and intermingles them with the air. But the pores of the particles of gold and silver are extremely minute, and therefore permit but small quantities of the essences of those ores to exhale from them; consequently, it is their density of substance, and heaviness of weight, which causes them to endure heat and remain in those parts of this world, so that small quantities of gold or silver are found far to the north or south of the equator; while the warmth of those beams repels the small particles of minerals and ores which are lighter in weight from the equator, and fleets them with the wind sometimes towards the northern, and at others, towards the southern climates; and, as those globules cool, they contract smaller, become heavier in weight, and fall lower; while some of the minerals and ores which are of the same nature, in the water and earth,

earth, will draw some of the small particles of those different sorts of the essences of matter from among each other, into their pores, and increase their growth: consequently, there is a larger quantity of coarse minerals and ores in the northern and southern latitudes than in hot climates. Quicksilver, loadstone, and other ores and minerals, continually draw cold from the air, water, and earth, and it impregnates and unites to their substances, as may be sensibly perceived by feeling them, and they reflect and extend part of it toward that pole which happens to be situated nearest to them, excepting such loadstones as are procured from any climate from the northern side of the equator, to be manufactured into magnets in the same part of the world, so that by conveying it to a southern climate, will draw or point only towards the north pole. But if loadstones were to be gathered and manufactured in southern climates, those instruments probably would attract only towards the south pole; consequently, the generality of minerals and ores in the water and earth, draw cold from the northern climates, and also from the cold in that polar star, and continue the north pole of this globe nearly opposite to it, while the generality of minerals and ores in the southern parts of this world, draw cold from those climates, and also from its polar star, and continue the south pole of this globe nearly opposite to it; therefore it is the cold of minerals and ores operating in those contrary directions, which prevents the poles of this world from turning from opposite to those stars, and also from advancing under the

the perpendicular sun, and as it moves yearly forces it in an oval circuit of space? otherwise, if it were to revolve in a round circuit, the poles would pass from opposite those polar stars.

ON THE IRREGULAR MOTIONS OF THE WORLD,
AND THE MANNER OF ITS CAUSING THE
VARIATION OF TIME.

THE sun continually enlightens and warms the surrounding planets, and move each of them in a circuit of space, and when two or three of those orbs are revolving in the nearest parts of their circuits under that luminary, and above the warm enlightened side of this world, during the day there, according to the size of each, the dark sides and poles of those orbs are cold, and draw in incompassing directions from the cold and dark side of this world, while their warm enlightened sides reflect and glance a proportionate quantity of warmth into the rays of the sun through that half of this atmosphere, which is next that luminary during the day; and, in a small degree, warm and enlighten the air, and impregnate, depress, and repel this globe about in a larger circuit of space than usual; and likewise several thousand miles farther from the perpendicular sun, and cause colder seasons during that time of the year, and perhaps several others succeeding it, until one or two of those planets revolve into the further parts of their circuits from that luminary, which are beyond

the darkened side of this world during the night; then the cold in each orb draws, while their warm enlightened sides reflect proportionate quantities of warmth into the other half of this atmosphere, which is in a contrary direction to the sun, and in a small degree, warm and enlighten the air, and impregnate, depress, and repel this globe about in a smaller circle of space than usual, and likewise several thousand miles nearer to that luminary, and cause warmer seasons during that year, and probably several other succeeding years; but when nearly the same number of planets are revolving above this world, as beyond the contrary side of it, then it moves in a regular circuit yearly, likewise the rays of that luminary are continually passing around this atmosphere, and between it and those planets, and keep this globe from revolving to an extreme farther distance than that of the usual circuit; and whether the chief number of planets are revolving above the enlightened side, or beyond the dark side of this globe, those orbs according to the size of each, reflect and glance proportionate quantities of those warm beams into that part of this world which are next to them, and exhale mist from the water and earth into the atmosphere, and as they cool they will draw and unite into larger and thicker clouds than usual, and the wind fleets the chief parts of them from thence, and they soon extend in the atmosphere over a large tract of this globe, and intercept some of the heat of the perpendicular and oblique rays of the sun during day, and the air cools some parts of those clouds and vapours, and frequently causes

causes some of them to fall in drops of dew or rain to this globe, and diminished the heat from it, into a temperate warmth that assists to regulate the yearly motion of this world.

When this globe moves about in a larger circuit of space during some years than others, it causes a little loss of time, and though one day is added to February every fourth year, it cannot equalize time. Likewise, extreme high mountains, such as the Alps, and other irregularities in the roundness of the globe, prevent the sun from appearing in those extreme low vallies which are near the uneven parts of the surface of the world, and cause a variation of several minutes of time in the hours of the morning and evenings of the days in some of the months more than others in each year.

If the surrounding stars and planets which are nearest to the dark side of this world during the night, were insufficient to reflect warmth to the different elements on that side of this globe, the cold would be intense, and freeze that part of the water into ice ; therefore, in order to prove that this world receives warmth and light from those orbs, take a dish, or plate, made of pewter, or any other polished metal, and with the hand, hold one side of it opposite to, and within the heat of a large kitchen fire, and turn it nearly half round, so that it may glance some of the heat and light of the fire to either of the side-walls at several yards distance, and when a person puts the naked hand into that reflected warmth and light it will nearly scorch the skin.

**ON THE CAUSE OF THE ENCREASE, AND
DECREASE OF DAYS AND NIGHTS, AND SEA-
SONS OF THE YEAR IN DIFFERENT PARTS
OF THE WORLD.**

In the month of December this world moves from the northern hemisphere toward the eastern hemisphere, in the first quarter of a yearly circuit, and the rays of the sun cause the season of spring in the northern climates; and in the month of March the equator of this globe arrives under that perpendicular luminary, that extends beams to the north pole, and likewise to the south pole, and causes twelve hours day, and twelve hours night, in all latitudes from each side of the equator of the globe; and while it moves from the eastern hemisphere in the second quarter of a yearly circuit, causes the season of summer in the northern climate; and during that half of the year, the days successively lengthen, and nights shorten; and the sun progressively appears higher, and afterwards lower above the surface of this globe, at the equator, and causes light six months at the north pole. During that time, the days shorten and nights lengthen, and cold increases, and causes autumn and winter in the southern climes; and the bulk of this globe at the equator obscures the sun and causes six months of darkness below the horizon at the south pole; and in June this world moves from the southern hemisphere toward the western hemisphere in the
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third quarter of a yearly circuit, and causes autumn in the northern climates ; and in the month of September the equator of this globe will be under the perpendicular sun that extends rays to both the south and north poles, and causes equal length of day and night in all parts of this world ; whilst it moves from the western hemisphere in the fourth quarter of a yearly circuit to the northern hemisphere, and causes winter in the northern climates ; and during that half year the days shorten and nights lengthen, and the sun disappears below the horizon, and causes six months darkness at the north pole, and during that time the days lengthen and nights shorten, and warmth increases, and causes spring and summer in the southern climates, and the sun appears above the surface of this globe and causes six months light at the south pole ; consequently while it is spring and summer in the northern climates, it is autumn and winter in the southern latitudes ; and while it is autumn and winter in the northern latitudes, it is spring and summer in the southern climes, so that there are two springs, two summers, two autumns, and two winters, including the opposite seasons on each side the equator during every succeeding year of the world.

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which it moves from the western hemisphere in
the fourth quarter of a yearly circuit to the nor-
thern hemisphere, and causes winter in the nor-
thern climates; and during that half year the days
shorten and the nights lengthen and the sun dis-
cusses below the horizon, and causes the months
between the north pole, and during that time
the days lengthen and the nights shorten, and winter
in the southern hemisphere, and summer in the
northern hemisphere; and the sun appears above the
horizon of this globe and causes six months day
and six months night; consequently while it is spring
and summer in the northern climates, it is autumn
and winter in the southern hemisphere; and while
it is winter and winter in the northern climates,
it is spring and summer in the southern climates;
so that there are two springs, two summers, two
autumns, and two winters, including the opposite
seasons on each side the equator during every
succeeding year on the world.

